to conventional single-frequency sampling techniques. As noted above, a sensing zone may correspond to a single electrode **112**, or a common modulation signal **110** may be provided to multiple electrodes **112** to create a larger sensing zone that effectively behaves as a single "electrode" for purposes of subsequent demodulation and computation. The modulated waveform **110**, being the function of a distinct digital code **106**, uniquely identifies the sensing zone to which it is applied, thereby allowing ready application of CDM and other conventional spread-spectrum techniques. FIG. **3** shows an exemplary spectral plot **300** that emphasizes the frequency domain differences between the spectrum **302** of carrier signal **111** and the spectrum **304** of modulated signal **110**. In contrast to a single-frequency carrier signal **302**, the multi-frequency spectrum **304** of modulated signal received on **114** is much wider. Because the spectrum **304** of the modulated signal distributes available power across a much wider sensitivity band, the effects of narrowband noise signals **306** at or near any particular frequency of interest are significantly reduced. That is, if a spurious noise signal **306** happened to occur near a single-frequency (or narrowband) carrier signal **302**, any electrical effects present within the sensing channel **113** could be overwhelmed by the noise. Moreover, adverse effects of wider-band noise **308** or interference from other modulated electrode channels **310** can be mitigated through spread-spectrum techniques, as shown in spectral plot **350** of received signal **116**. Plot **350** shows that the demodulated signal **352** (corresponding to coupling of a channel **113** and/or the presence of object **121** near the demodulated sensing region) is contained within a relatively narrow frequency band, whereas signals **354** received from other channels are spread across a wider band. Both wideband noise **308** and narrow band noise **306** are similarly spread across wider frequency bands **356** and **358** in the demodulated signal. By increasing the bandwidth of the applied modulated signal **110**, then, the signal-to-noise ratio in the demodulated signal **116** is improved dramatically. The demodulation in turn spreads the noise outside of the signal band, which then becomes quite narrow, thereby allowing the desired signal portion **352** to be readily extracted by a narrow band filter or the like.

[**0041**] This concept can be further exploited by selecting digital codes **106** that avoid known sources of noise. That is, digital codes **106** of any bit length may be applied to carrier signal **111** to create spectral "gaps" at frequencies known to be susceptible to spurious noise. By applying conventional Fourier analysis (e.g. using a simple fast Fourier transform (FFT) or the like), digital codes can be selected to create modulation signals **110** having many desired spectral characteristics. Codes applied to any modulated electrode **112** can be modified during operation (e.g. step **210** in FIG. **2**) and/or may be pre-selected to avoid expected or observed noise in resultant signals **116**. Alternatively, the particular codes **106** applied to one or more electrodes **112** may be randomly, pseudo-randomly, deterministically or otherwise modified during sensor operation, thereby statistically filtering any noise present within resultant signals **116** or demodulated signals **118** over time. Similarly, particular spatial frequencies or spatial positions can be emphasized (e.g. with code gain) or filtered out by the codes applied to different modulation electrodes. Code shifting during operation may provide other benefits (e.g. discrimination of or resilience to moisture) in addition to reducing the effects of noise or spurious effects of non-input objects (palm etc). In various equivalent embodiments, the frequency, phase, amplitude and/or waveform of carrier signal **111** may be adjusted in place of or in addition to modifying digital codes **106**.

[**0042**] With reference now to FIG. **4**, spread spectrum techniques that simultaneously apply multiple coded modulation signals **110**A-D to various electrodes **112**A-D are able to identify multiple presences **408**, **410**, **412** of objects **121** located within sensing region **101**. Multiple objects may correspond to the presence of multiple fingers on a touchpad, for example, a palm resting on sensor **100** during use, simultaneous presence of a finger and a stylus, and/or any other combination of inputs. Electrical effects resulting from the various presences **408**, **410** can be conceptually projected along one or more axes **404**, **406** to identify the relative positions of the objects along that axis, as shown in FIG. **4**. That is, peak value(s) of electrical effects can be correlated to relative positions of objects **121** with respect to sensing region **101**. In the example of FIG. **4**, a finger **408** may be identified by increases in electrical effects projected along an "X" axis **404** and a "Y" axis **406**. By correlating the relative X and Y positions of peak electrical effects, the location of presence **408** can be correlated in two dimensions (or any other number of dimensions). Similarly, the example of FIG. **4**A shows a larger area indicating a second presence **410** that results projections of electrical effects in axes **404** and **406**. These multiple projections of electrical effect can be additionally correlated to identify images (e.g. "outlines") of objects **121** present within region **101**. Taking this concept further, one or more images **408**, **410** may be subsequently processed as appropriate. Presence of multiple fingers within region **101** may be used to perform scrolling, mode selection or other tasks, for example. Similarly, if an image can be identified as resulting from a user's palm (or another undesired portion of the user's body), that image **410** can be subsequently rejected in future processing, such as reporting of positional information or other output signals.

[**0043**] In the exemplary embodiment shown in FIG. **4**, the two axes **404**, **406** generally correspond to portions of modulated electrodes **112** or their associated channels shown arranged in two approximately orthogonal directions as in FIG. **1**B. Alternate embodiments, however, may include any number of electrodes **112** arranged in any overlapping, non-overlapping, matrix or other arrangement. An example of a sensor **500** with overlapping electrodes **112**A-G arranged in two dimensions is shown in FIG. **5**. In such embodiments, electrical effects on received channels can effectively be independently measured at each crossing of the electrodes in two directions (e.g. X and Y directions corresponding to axes of **404**, **406** in contour plot **400**), with the results correlated in controller **102** to provide a two-dimensional representation or image of object **121** rather than two one-dimensional "silhouettes" like **404** and **406**. In such cases, electrodes arranged in the first direction (e.g. electrodes **112**A-C) may be modulated at separate times from electrodes arranged in the second direction (e.g. electrodes **112**D-G), with one or more independent received signals **116** at any one time from either set of electrodes (e.g. electrodes **112**D&F) being provided to demodulator **117** via a multiplexer **502**. FIG. **5** shows the various electrodes **112**A-G coupled to both modulator **107** and demodulator **117** via a multiplexer **502**. The multiplexer may also connect